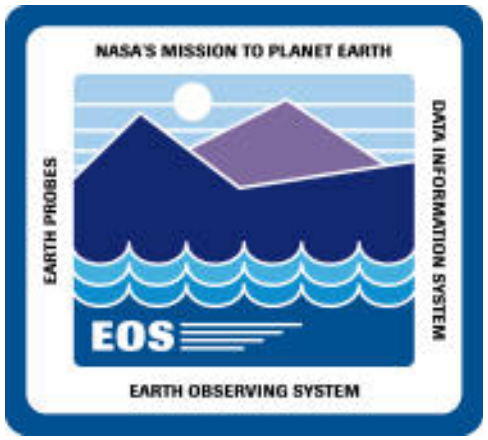

Release B Planning and Scheduling Hardware Selection

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22 April 1996

Hardware Sizing Analysis

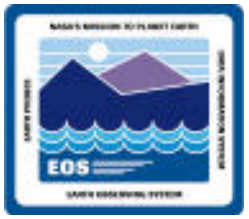
Scheduling Drivers

- AutoSys Job Volume
  - Dependent on number of PGE activations, number of job activations per PGE, and reprocessing
- AutoSys GUIs RAM requirements
  - Dependent on the number of jobs for which status is displayed
- Backup and Recovery In Support of Scheduling
  - Second machine required to run AutoSys Shadow Event Processor which performs automatic backup and recovery
- Growth
  - Support increases in production processing and reprocessing

Planning Drivers

- PDPS (Planning and Data Processing Subsystem) Database
  - Contains critical data (PGE attributes, etc.)
  - Peak transaction load occurs when creating a 30 day plan
- Backup and Recovery In Support of PDPS Database
  - Second machine required to run Sybase replication server for PDPS database which performs automatic backup and recovery
  - Maintains duplicate database to ensure safety of critical PGE information
- Growth
  - Support increases in production processing and reprocessing

Planning/Scheduling Assumptions



Assumptions (based on 2/96 technical baseline for Epoch k, 3rd qtr '99):

- **Working with MODIS to limit PGE activations to 4,000 at GSFC**
- **GSFC and LaRC operate 24 hours per day 7 days a week**

DAAC Site	# of PGE Activations	# of jobs per PGE	Repro-cessing	Total # of jobs/day
GSFC	4,004	4	2	32,032
LaRC	778	4	3	9,336

AutoSys GUIs RAM Analysis

Assumptions (at Epoch k):

- **Four GUIs are active on one platform (worst case)**
- **Status of 32,032 GSFC or 9,336 LaRC jobs being displayed**
- **Each GUI requires 20,000 kbytes of RAM as a base plus 5.5 kbytes for each job**

[20,000 kbytes + (5.5 kbytes/job x 32,032 jobs)] x 4 GUIs = 785 Mbytes of RAM at GSFC

[20,000 kbytes + (5.5 kbytes/job x 9,336 jobs)] x 4 GUIs = 286 Mbytes of RAM at LaRC

PDPS DBMS Peak Transaction Load Analysis

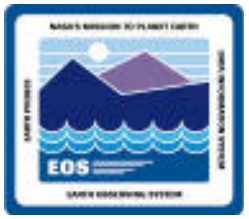
Assumptions (at Epoch k, 3rd qtr '99):

- **The Planning Workbench function of creating a 30 day plan imposes the greatest peak transaction load on the PDPS database**
- **A 30 day plan requires the input of 45 days worth of data**
- **Transaction loads double due to Sybase replication (database backup)**

GSFC peak PDPS DBMS transaction load is 9,009,000 per 30 day plan creation

LaRC peak PDPS DBMS transaction load is 1,751,000 per 30 day plan creation

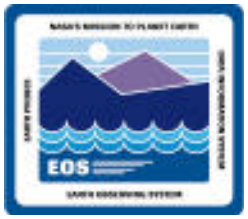
Hardware Assumptions



- **AutoSys customer experience has indicated AutoSys can sustain 45 jobs per minute while running on a 75 MHz Sun Sparc 20/712 2-CPU machine.**
- **It is estimated that our throughput will be 29 jobs per minute (42,120 jobs/day) when using the AutoSys high availability option (shadow event processor)**
- **It is estimated a 4-CPU Sun UltraServer would have a throughput of 187,200 jobs/day.**

- **A 75 MHz Sun Sparc 20/712 2-CPU machine is rated at 305 transactions per second (TPS). It would take approximately 2 hours to process LaRC's 30 day plan creation peak load of 1,751,000 transactions (1,751,000/(305 tps x 60 sec/min).**
- **It is estimated that a 4-CPU Sun UltraServer TPS rating equals 1,360. It would take approximately 2 hours to process GSFC's 30 day plan creation peak load of 9,009,000 transactions.**

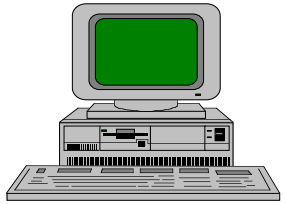
Hardware Assumptions (con't.)



	Required	Provided Capacity
GSFC		
• Job Throughput	32,032 jobs/day	187,200 jobs/day
• Time to process a 30 day plan (9,009,000 DBMS transactions)	reasonable	111 min.
LaRC		
• Job Throughput	9,336 jobs/day	42,120 jobs/day
• Time to process a 30 day plan (1,751,000 DBMS transactions)	reasonable	96 min.

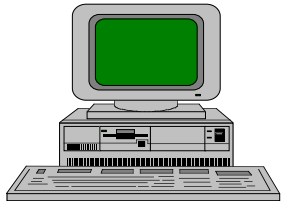
GSFC Hardware Configuration (and EDC and NSIDC)

Planning



(Production Planner)

Sun 20/71



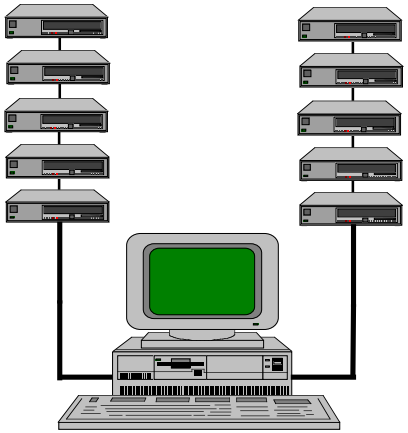
(Resource Planner)

Sun 20/71

PDPS DBMS Server:

5 x 2.1 GB

5 x 2.1 GB



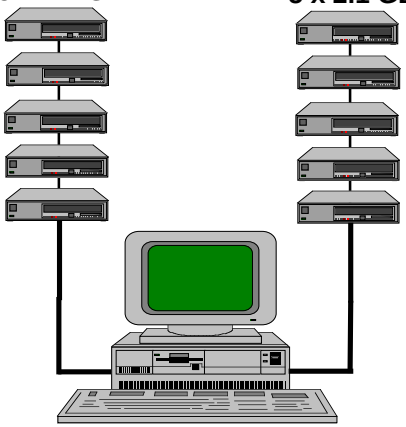
- PDPS database
- AutoSys Shadow Event Processor
- 4 CPUs
- 2 GB RAM

Scheduling

Scheduling Server:

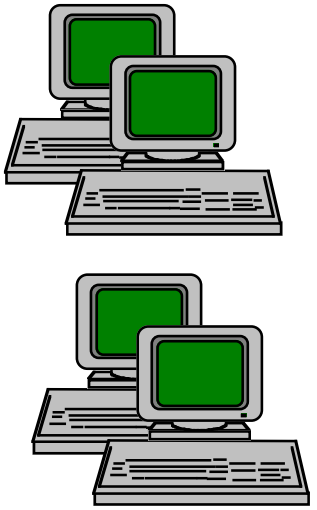
5 x 2.1 GB

5 x 2.1 GB



- AutoSys Event Processor
- Replicated PDPS DBMS
- 4 CPUs
- 2 GB RAM

X terminals



(Production Monitors)

- AutoSys GUIs

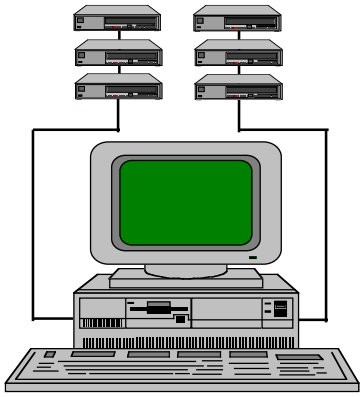
Sun UltraServers

LaRC Hardware Configuration (and JPL)

Planning

PDPS DBMS Server:

6 x 2.1 GB

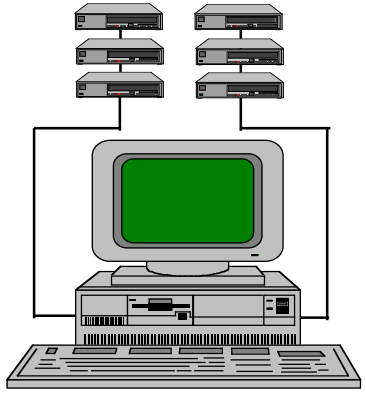


- PDPS DBMS
- Planning Workbench
- 2 CPUs
- 512 MB RAM

Sun 20/712
(Resource Planner)

PDPS DBMS Server:

6 x 2.1 GB



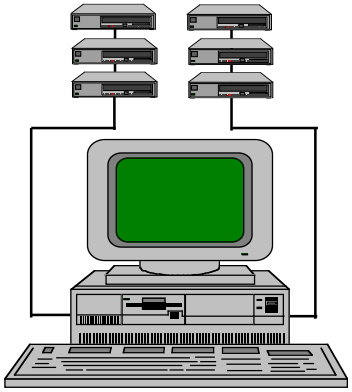
- Replicated PDPS DBMS
- Planning Workbench
- 2 CPUs
- 512 MB RAM

Sun 20/712
(Production Planner)

Scheduling

Scheduling Server:

6 x 2.1 GB

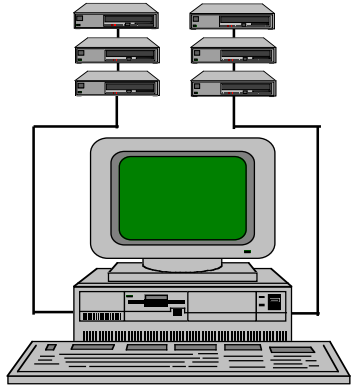


- AutoSys Event
- Processor
- 2 CPUs
- 512 MB RAM

Sun 20/712

Scheduling Server:

6 x 2.1 GB



- AutoSys Shadow Event Processor
- 2 CPUs
- 512 MB RAM

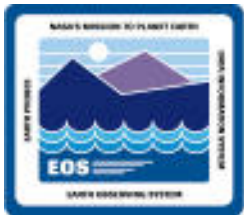
Sun 20/712

(Production Monitors)

X terminals

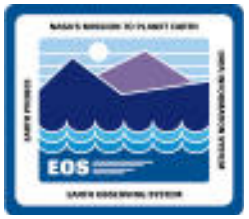
- AutoSys GUIs

Other Considerations



- **External disk used; RAID disk mirroring is not needed with AutoSys high availability option and Sybase replication of the PDPS database**
- **2.1 GB disks used instead of 4.2 GB disk in order to provide faster disk access and to provide more “spindles” which allows distribution of Sybase data, log, and index files**
- **Scheduling X-terminals: a pair of screens is required to properly display the status of production jobs to the user**
- **Design supports SSI&T access to planning workbench functions**

Backup and Recovery



GSFC

- **Scheduling Server machine or disk failure:**
  - **AutoSys Shadow Event Processor on the PDPS DBMS Server automatically continues to execute the schedule**
- **PDPS DBMS Server or disk failure:**
  - **replicated PDPS DBMS on Scheduling Server automatically continues with PDPS DBMS transactions**
- **Planning Workstation failure:**
  - **use second workstation for both Production Planning and Resource Planning**

LaRC

- **Scheduling Server machine or disk failure:**
  - **AutoSys Shadow Event Processor on the other Scheduling Server machine automatically continues to execute the schedule**
- **PDPS DBMS Server or disk failure:**
  - **replicated PDPS DBMS on the other PDPS DBMS Server machine automatically continues with PDPS DBMS transactions**